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ABSTRACT

This study investigated the role of technology in a high school and an elementary school in West Virginia that are involved in a collaborative educational reform effort, including innovative ways to prepare students to think critically and creatively. The study focused on what technology is being used and how it is being implemented, how technology was used prior to restructuring, and what the future plans for technology implementation are. Questionnaires, teacher interviews, and classroom observations were used to collect data. Results showed the most common former uses of technology included posters, bulletin boards, filmstrips, and overhead transparencies. Today videos and computers are used to a greater extent. Future plans include networking computers and the acquisition of peripherals for whole-class viewing of computer information. Faculty and administrators believe that technology is a vital part of the restructuring movement, but it is only a tool to be used in the teacher's repertoire. Graphs for each school showing the present and prior technology use, overall use, types of software used, and types of instructional use of technology are included. (Contains 11 references.) (KRN)

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ED 362 162

Title:

Technology Implementation in Two Restructuring Schools: Past, Present, and Future

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Abstract

The role of technology in two restructuring schools is investigated in light of past, present, and future implementations. The schools have been involved in restructuring for two years and are collaborating with nearby West Virginia University in that movement. Questionnaires, teacher interviews, and classroom observations were used to collect data. Results showed the most common former uses of technology included posters, bulletin boards, filmstrips, and overhead transparencies; today,videos and computers are used to a greater extent. Future plans include networking computers and the acquisition of peripherals for whole-class viewing of computer information. Faculty and administrators believe that technology is a vital part of the restructuring movement, but it is only a tool to be used in the teacher's repertoire.

Technology Implementation in Two Restructuring Schools: Past, Present, and Future

West Virginia University and the Claude Worthington Benedum Foundation have joined forces to aid the restructuring movement in six professional development schools (PDS) near the Morgantown, West Virginia area. Commonly known as the Benedum Project, it is a collaborative educational reform effort in West Virginia involving over 300 public school teachers, principals, and superintendents, along with 115 West Virginia University faculty members. The purpose is to create a new vision for schools and teacher education based on the best research and practice available. New ways of thinking about teaching and administration are being developed to keep in touch with the needs of today's society. Classroom practices include innovative ways of producing students who think critically and creatively. Because technology has become so pervasive in our world, its use has become an important inclusion in classroom instruction. This paper[1] reports the efforts of two PDS sites, Morgantown High School and East Dale Elementary, in reforming the educational process with particular emphasis on the implementation of technology to keep in step with the goals of society. For the purposes of this study, technology is defined as facilities, equipment, and instructional resources used in educational settings.

Review of Literature

In the past, technology implementation in school reforms meant adding new technology to the traditionally structured classroom. At times, when used for seat work, drill-and-practice, or as an add-on, it did nothing more than reinforce passive learning. New tools and techniques will be needed for restructuring to succeed on a large scale. Sheingold (1991) feels that the most serious challenge for restructuring efforts will be addressed by changing *what* and *how* students learn in school. She continues by saying it is unlikely that ambitious goals for learning and teaching can be met without widespread, creative, and well-integrated uses of technologies of many kinds.

If the purpose of education is to prepare us for life in the world, then the technology that is already being utilized in the world should be made available to the students. Because technology is more pervasive in the world outside the classroom, it is now more legitimized for use in the school. As Sheingold (1991) clearly points out, "authentic and legitimate work, work that has real connection to the world outside school, is likely to be engaging and memorable, precisely because it does matter" (p. 19).

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[1] The research reported in this paper was supported by a grant from the Claude Worthington Benedum Foundation.

Collins (1991) has done extensive research in computer use in the classroom. He finds three distinct areas of classroom computer application: (a) computers used as tools (word processing, programming skills, networking in lab settings, spreadsheets, and data base applications); (b) computers used as integrated learning systems (exercises, and students portfolios); and (c) computers used as activity/teaching units (simulations, games, and intellectual motivation uses).

When technology is applied and implemented as part of restructuring, it becomes active, hands-on, student-centered learning (Kell, Harvey, & Drexler, 1990). Restructuring and technology function in tandem, each reinforcing the other. Technology alone will not solve all of the educational problems; it must be integrated with the curriculum to improve teaching/learning, problem-solving skills, and enhance critical, creative thinking

Technology in the classroom is not without problems. Ray (1991) states that the majority of today's educators do not understand the how's, why's, and what's of technology. They recognize a need to receive more information and training, but there is often not enough time or financial support as well as instructional materials needed to do so. Many students have to share computers and, in some cases, classes are held in labs that are minimally equipped. When technology is utilized, it is sometimes done so without a real purpose, intent, or goal. It seems to provide schools the opportunity to say they are technologically in step. Other problems include how to handle non-functional materials and down-time while the hardware is in repair; the organization of restructuring; and technology utilization sometimes so poorly conceived that directions and goals are unclear or not even stated.

Other barriers to technology utilization include: (a) lack of funds to purchase hardware and software; (b) time to prepare the integration of technology into the teaching/learning process; (c) time needed to finalize goals and projects for utilizing technology and in renovating facilities to accommodate hardware; (d) users anticipating more powerful computers and other hardware; (e) facilities experiencing installation problems; and (f) downtime of networks (Falk, 1992).

Summary

Reform efforts are not new, but the current restructuring effort is unique in its way of dealing with revision. Teaching methodologies are changing because of the atmosphere created by the new approach to education as seen in restructuring schools. The information age in which we live almost necessitates that students know where and how to find what they need to know to succeed in life. Students are being taught to be critical thinkers, seeking out information from many sources in a variety of ways. Technology is one of those ways being applied in the classroom as a ramification of what is present in the "real" world.

The Benedum Project is now in its third year of coordinating collaborative efforts between West Virginia University and the participating public schools. Stated goals of improving education in both public and higher education practices are met in various ways which include the use of technology in classroom instruction and management to reflect today's societal needs. The two schools described in this study were chosen because of their exemplary use of technology in restructuring efforts.

Purpose of the Study

The purpose of this study is to determine the role of technology in the restructuring movement in schools.

Research Questions

The specific research questions of this investigation are: (1) What technology is being used in two restructuring schools and how is it being implemented? (2) How was technology implemented prior to restructuring? and (3) What are the future plans for technology acquisition and implementation?

Study 1: East Dale Elementary School
Design of the Study

Sample

Described as a rural school by virtue of its population, East Dale Elementary school is located in northern West Virginia. It is comprised of 644 students from first through sixth grade with 38 teachers, one principal, and one vice principal collaborating to direct educational activities. The average class size is 24 students. Kindergarten students are located in another building, but are often transported to the school for events.

Method

Information was gathered through questionnaires completed by teachers and administrators; three teacher interviews; and videotaping classroom activities. East Dale Elementary was identified as a PDS site with a high use of technology through the recommendation of the Assistant to the Director of the Benedum Project at West Virginia University.

Data from questionnaires were collected in October, far enough into the school year for teachers to be beyond the beginning-of-school activities, yet fully acquainted with technology plans for their classrooms. Videotaping and interviews took place in October and November for the same reasons.

Procedures

Questionnaires relating to the past, present, and future uses of technology were distributed to 38 teachers and two administrators at a faculty meeting by the principal with a request to return them in two weeks. Twenty of these were completed for a 50% return rate. Quantifiable data from the questionnaires were entered into a database and analyzed for comparative information. Semi-structured interviews were held with three teachers who were recommended by the principal as being highly involved with technology. The interviews, approximately 20 minutes long, were audio-tape recorded and transcribed. During one day of classroom observations, 35-millimeter slide photographs and videotape of students using technology were taken. Journal notes of those activities were also recorded.

Analysis

To answer the research question of what technology is being used in this restructuring school and how it is being implemented, transcriptions of teacher interviews were read several times; results of database information gathered from teacher questionnaires were categorized and transformed into graphical representations; and journal notes from classroom observations were studied.

To answer the research question of how technology was implemented prior to restructuring, data from teacher questionnaires were extracted and graphically represented, transcriptions of teacher interviews were reviewed and information relating to the use of technology was retrieved.

To answer the research question of what future plans are for technology acquisition and implementation, teacher questionnaires were scrutinized and transcriptions of teacher interviews were studied.

Results

Descriptive Overview

In 1987, East Dale was chosen as one of only 130 schools nationwide to be named a National School of Excellence, an honor bestowed by the Department of Education in Washington, D. C., after careful scrutiny from federal observers. A prerequisite to this distinction was being named a West Virginia School of Excellence.

East Dale's restructuring movement is based on a vision of education in which, collaborating with higher education, the community, teacher, staff, and students, the plan is to integrate knowledge and critical thinking to develop the whole learner. The school's stated educational goal is to motivate students to value

education and become responsible decision makers and life-long learners. Their goal for the use of technology is to expand all learners' knowledge of current and future uses of technology.

Rather than the traditional classrooms with rigid walls as barriers, some of East Dale's classes are arranged into "Clusters" in large areas for instructional purposes. Cluster 100 includes students from Grade 2 and part of Grade 3; Cluster 200 has students in Grade 1 and part of Grade 2; Cluster 300 students are from part of Grade 3 and Grade 4; and Cluster 400 is made up of students in Grades 5 and 6. The areas are open, and the students are separated into groups, but they do contain the usual classroom equipment of tables, chairs, teacher's desk, and books. Five teachers share all resources in the Cluster.

The data collection showed that East Dale Elementary School has an abundance of technology in use. Four general areas of use surfaced and include: (1) Clusters, (2) Computer Lab, (3) Technology Site, and (4) Science Lab. Other departments such as the Library and the Gifted program have technology in place.

Clusters. Cluster 100 (Grade 2 and part of Grade 3) has six Apple computers for student use with content-area and enrichment software. Future plans include networking IBM computers with Cluster 200 in order to use software installed on that network. Cluster 200 (Grade 1 and part of Grade 2) has a network of 16 IBM computers with which students use software for mathematics, language arts, spelling, basic skills, and write their own stories with a desktop publishing program.

In Cluster 300 (part of Grade 3 and Grade 4) there are 12 IBM PCJunior computers. The software used is for word processing, keyboard skills, and as a reinforcer for math instruction. Cluster 400 students (Grades 5 and 6) are sent to the Computer Lab in a separate room for instruction in computer skills.

Computer Lab. The Computer Lab at East Dale has been in existence for several years. The IBM PCJunior computers, now housed in Cluster 300, were previously situated in this location. This year, 15 IBM Model 2 computers are used by fifth and sixth graders learning keyboard skills and word processing. One day a week they have their choice of math, geography, or spelling software to use. The students are paired for 20-minute work sessions for each partner in a 40-minute period every day.

The director is completing her first year of teaching in the computer lab and had to arrange and coordinate all equipment and activities for her students. She also offers informal help to any teacher requesting it. Plans are in the making for fund-raising activities to purchase an overhead projector and LCD pad for whole-class viewing. Networking with other computers in the school is a possibility sometime in the future.

Technology Demonstration Site. Fifth and sixth grade students are exposed to language arts in a technology-rich multimedia environment. Installed only last year and funded though a West Virginia Department of Education Technology Demonstration Sites Grant, the glass-enclosed room contains a Macintosh computer; large-screen television/monitor; overhead projector; LCD pad which can be used to project the computer image to the entire class; CD-ROM drive; laser disc player; laser printer; scanner; and a Zap Shot camera which allows pictures taken to be shown on the television/monitor. Various software, laser discs, and compact discs (CDs) are used every day for instructional purposes.

The director of the site, who is the language arts teacher, has a total of 168 students daily in scheduled 40-minute periods. In an interesting use of technology, the students are videotaped while doing oral presentations of their written projects. Software used for written expression includes word processing and desktop publishing programs. Primarily used for enhancement activities, the site, according to the director, meets the needs of many of her students because of the interactions,

motion, and lack of intimidation of the technology. During one classroom observation, a laser disc tutorial of French vocabulary was being used and held the attention of all students as they repeated aloud what they saw on the screen.

Students in Kindergarten through Grade 4 are also exposed to multimedia when scheduling of the site permits. The director is instructing teachers in general use of the equipment and reports that they are beginning to feel capable of controlling it. She also tries to integrate in her teaching any relevant software that the students may be studying in other subjects. For example, laser discs dealing with the United States Presidents and First Ladies are used in a cross-curricular fashion with both social studies and language emphasis.

Before the installation of this multimedia site, language arts for fifth and sixth graders was taught in the Clusters with traditional paper-and-pencil activities. Future plans for including the present computer on a network are under discussion, and the purchase of software for other content areas will be considered as the site continues to develop.

Science Lab. In prior years, science teachers at East Dale Elementary were confined to teaching in their own classrooms and areas; but, with the inception of the Science Lab last year, their students are now exposed to a variety of technological equipment that piques the interest of students and teachers alike. A series of math and science software is used along with word processing, but the six Apple IIgs computers were purchased specifically for use with the *LEGO* Robotics program which students use to control features and actions of various projects such as carousels, optical scanners, cars, and machines. A climatarium affords experiments with different wave lengths of light, temperature, humidity, and acid rain while learning about plant growth. Other science equipment used in the lab include microscopes, fresh-water marine aquarium, and embossed desk-tops on which measurement devices, graphs, and data recorders are located.

The lab is used primarily for fifth and sixth grade; but, as early as Kindergarten, students are exposed to the *LEGO* construction principles of levers, simple machines, and physical laws. The director of the Science Lab has worked collaboratively with other teachers in developing the curriculum and corresponding activities for lab use. He has spent time training them to use the technology and is still in the process of doing so. The curriculum stresses technology for communication, manufacturing, construction, and business.

Students from surrounding schools sojourn to the Science Lab in scheduled visits. Fourteen schools send students in Grades 3 through 6 for a monthly exposure of three hours. Early next year, the director will be supervising after school and Saturday programs in the lab for nearby communities.

A Macintosh LC computer has been purchased with plans for using it as a file server to network with other computers in the building. Due to the recent origins of the lab, the director is working on teacher training to aid in implementing the present technology rather than acquiring more hardware or software. He feels that ". . .all too often technology and new things in the classroom get put aside for lack of an understanding by the teachers." With that in mind, he is trying to "settle in and make use of what we have."

Other Areas. Technology appears in many areas of the school and it is not unusual to find a computer sitting by a table in an out of the way place such in the remedial reading teacher's space located adjacent to the Library. The Library has two IBM computers for management of resources and student use of Collier's Student Encyclopedia. There are two large screen monitors for whole class viewing of videos and the school's gifted students have exposure to computers in their program.

Summary of Results

Past Implementation. Generally speaking, past uses of technology included items such as posters, bulletin boards, silent or sound filmstrips, video tapes, overhead transparencies, 35 millimeter slides, and limited use of instructional television broadcasts. Single computers are now available in each cluster for teacher use along with networked and stand-alone computers for student use where, in past years, none existed (See Figure 1).

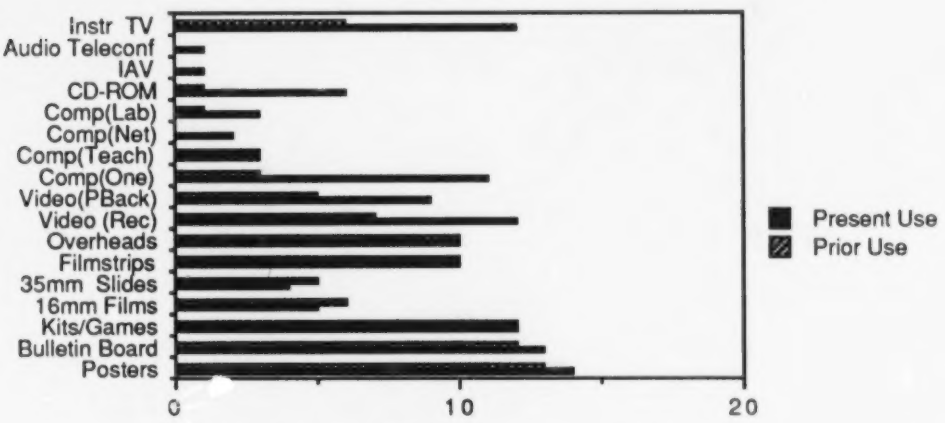

Figure 1
Present and Prior Technology Use - East Dale

Present Implementation. Students at East Dale Elementary School are exposed to technology from Kindergarten through sixth grade. General classwork in the Clusters is enhanced with stand-alone computers and those on networks, while special areas such as the Technology Demonstration Site for language arts, the Science Lab, and the Computer Lab are available for instruction in those specialized areas. The technology is up-to-date and being used regularly. Teachers have taken the initiative in learning how to teach with technology and are sharing their knowledge with other schools and students.

Many teachers have become comfortable with using various technologies in their teaching such as CD-ROM (compact disc-read only memory) disks, instructional television broadcasts, and videotapes. Some have reported the use of overhead transparencies and 16 millimeter films as new uses since restructuring efforts have begun, while one teacher reported the use of a two-way audio teleconference in her pedagogy.

Today, technology at East Dale is used to the greatest degree for classroom instruction, but some teachers have reported using it for managerial purposes and professional development as well (See Figure 2). The computer is used, at times, as a secondary instructional tool (reinforcer for primary instruction) and as a reward, but most teachers reported using games and drill-and-practice-type software (See Figure 3) for supplementary instructional activities in their educational scheme (See Figure 4).

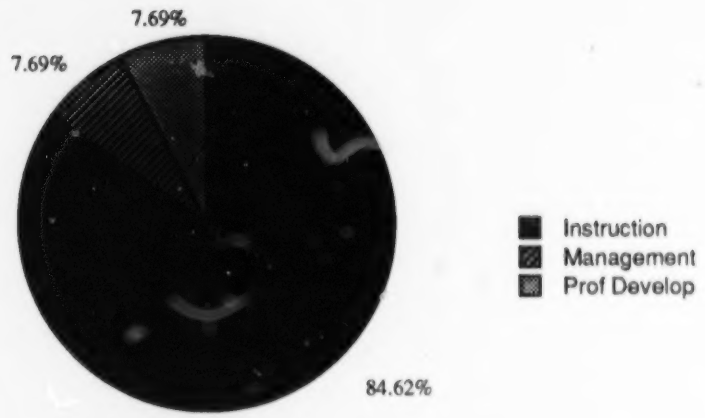

Figure 2
Overall Use of Technology

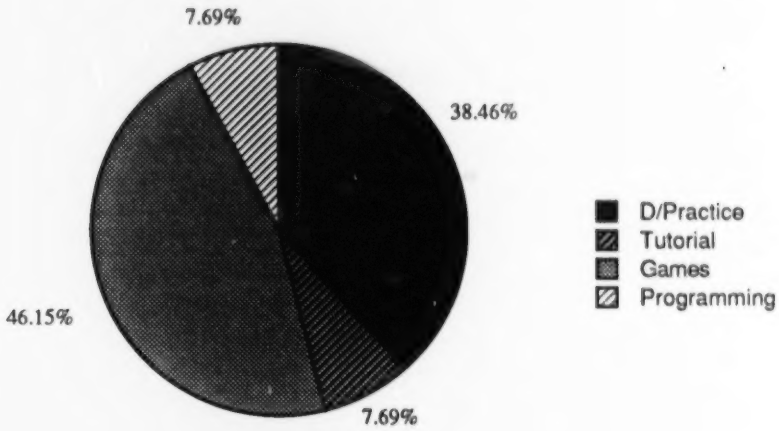

Figure 3
Type of Software Used

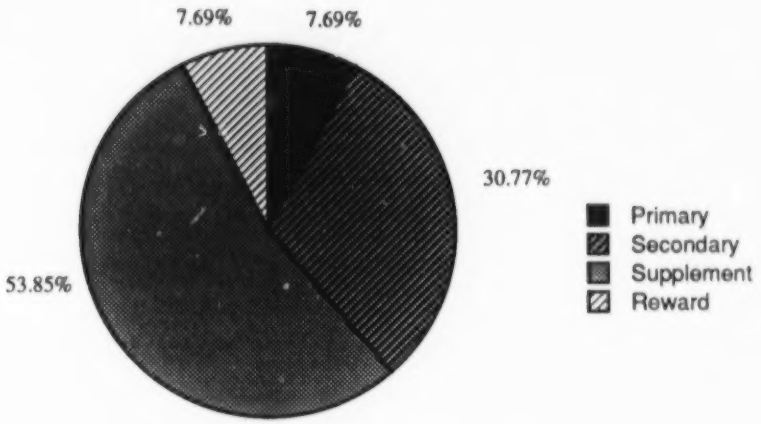

Figure 4
Instructional Use of Technology

Future Implementation. East Dale's faculty is not content with what they have, but are planning future improvements for their instructional technology. Networking with other areas of the school, modems for communications between schools, more hardware, and additional software are on the agenda. Plans are directed through the Technology Committee whose membership is voluntary and represents various categories of faculty and administration.

A troublesome concern of the presence of abundant technology was voiced by more than one faculty member. There is a fear that when sixth grade students leave East Dale, and enter a school with less to offer in technology-related instruction, they will not be as motivated to learn as they are now. The Science Lab director quoted a substitute teacher as saying that when she is at other schools teaching she often finds herself thinking ". . . if I only had East Dale's equipment, I could shown them this [material] so much more clearly." While this is a valid concern, it is not one that should deter any use of technology, rather it is hoped that the secondary schools will see the value of technology and implement it in their various curricula.

Study 2: Morgantown High School
Design of the Study

Sample

Approximately 1,381 students in Grades 10 through 12 attend Morgantown High School in Morgantown, West Virginia, located near the campus of West Virginia University. There are 80 faculty members, a principal, and an assistant principal in this large secondary school that has an average class size of 21.5.

Method

Morgantown High School was recommended by the Assistant to the Director of the Benedum Project at West Virginia University as a school with a high use of technology. Data from teacher and administrator questionnaires (same as Study 1) were collected during the same time frame as Study 1 (October, November). Four teacher interviews were conducted and videotapes of classroom use of technology were taken.

Procedures

Teacher questionnaires were distributed to the faculty of Morgantown High by the principal at a faculty meeting with a request to complete them in two weeks. Fifty-two teacher and one administrator questionnaires relating to the present, past, and future uses of technology were returned from a pool of 81 for a return rate of

64%. The quantifiable data collected were entered into a database for comparison purposes.

Three teachers were interviewed and audio-taped, while one phone interview was conducted with a fourth teacher. The interviews were semi-structured and the teachers were chosen upon recommendation of the principal and as a result of a request for volunteers on the teacher's questionnaire. Classroom observations were accompanied by taking still pictures and videotape of the students while using various forms of technology. Journal notes were taken during the observations.

Analysis

To answer the research question of what technology is being used in this restructuring school and how it is being implemented, the transcriptions of teacher interviews were read several times; the results of database information gathered from teacher questionnaires were categorized and represented graphically; and the journal notes from classroom observations were studied.

To answer the research question of how technology was implemented prior to restructuring, data from teacher questionnaires were extracted and transformed into graphical representations; transcriptions of teacher interviews were reviewed and information relating to the use of technology was extracted.

To answer the research question of what future plans are for technology acquisition and implementation, teacher questionnaires and transcriptions of teacher interviews were scrutinized.

Results

Descriptive Overview

Simply stated, the vision of the restructuring movement at Morgantown High is: "Morgantown High School: A School for the 21st Century." The belief is that, with the rapid changes that are taking place in the world, students must be prepared in the "new basics" of problem solving, decision making, critical analysis, reasoning and thinking skills, computer usage, and communications in addition to the basic knowledge required for usage of those skills.

Technology at Morgantown High is viewed generally as a means to an end, not an end in itself. There are individual teachers that use up-to-date technology in their classrooms, but three computer labs form the basis of technology implementation at the school. The long-range goal is to completely computerize the entire school and to network all classrooms together with six computer stations in each classroom for student use and one for teacher use. A Technology Committee, comprised of faculty members and administration, meets regularly to coordinate the use of and discuss the need for additional technology at the school.

Most of the technological use at Morgantown High is centered in the three computer labs which are categorized by departmental use. These include the: (1) Writing Lab, (2) Business Lab, and (3) Math/Computer Science Lab. The computers in these three facilities are networked together so that all users can access any software from any lab. Other areas of use include the journalism department, Social Studies classroom, Library, and the availability of computers on carts for any classroom.

Writing Lab. Prior to the inception of the Writing Lab, one English teacher had an Apple II computer purchased with a grant for use in remedial instruction. After becoming familiar with the benefits of technology, she transported students to West Virginia University's Human Resources and Education Computer Lab for instruction after school. She was gratified to notice that even students who did not like "regular" school would be present for this type of tutelage. Soon after seeing the advantageous effects of computer use, the Board of Education funded the present English Writing Lab. In place for five years, the lab is designated for all English teachers' use, although health and guidance

teachers also schedule time for their classes. Various health and guidance software is placed on the network server for use by those classes.

When the lab was originally opened, one of the English teachers reported that some of the math and science teachers voiced doubt that another department could make use of a computer lab. Staff development time was used to train the teachers in the use of computers in writing instruction with the result that now most classes use the lab profusely and as one teacher said ". . . our students are profiting greatly [from using the computer]." Word processing software along with composing process software such as *Writer's Helper* and *SEEN* are used to help students learn the techniques of writing as a process and how to write critical analyses. The 25 IBM computers and two printers are starting to show their age from heavy use, and the teachers who use the lab would like to see new hardware, such as color monitors and dual disk drive-computers, purchased in the future.

Business Lab. Word processing, integrated programs, and typing tutors are examples of the software used in the Business Lab which contains 25 IBM networked computers and two printers. Business students are the primary users of the lab and have help available from lab assistants chosen by the teacher. The students have been quoted by one of their teachers as saying that they ". . . learn more by being an assistant than by being just a student."

Multimedia technology is also offered in this lab using *LinkWay* software. The program allows users to create folders of their own information. It is an elective class in which students complete tutorials on the use of the software and projects such as autobiographies; at the end of the semester, they will contract with a teacher from another subject for future assignments in that class to be done with multimedia. In a related use of multimedia, a laser disc player is connected to a monitor and is being tested for a publishing company with provided software.

One of the teachers stays after school one day a week and one lunch hour to permit students to use the facilities beyond their normal class time. This is typical of the attitude of the teachers found at Morgantown High. They are quite willing to cooperate and share their knowledge of technology with others, even on their own time. Often at school from 7:00 A. M. until 5:00 or 6:00 P. M., some faculty members use after-school hours to learn how to use and implement the latest developments in teaching with technology.

Math/Computer Science Lab. Subjects such as Computer Concepts, Computer Science, Transitional Math, Integrated Computer Applications, Pre-Calculus, and Trigonometry are all taught in the Math/Computer Science Lab, which is directed by the Technology Coordinator at Morgantown High School. She is responsible for scheduling time for classes in all labs. For one half of her day, the director teaches Computer Science classes and the other half performs duties as lab coordinator which, beside scheduling lab time, include: repairing equipment; advising and training teachers in the use of hardware and software; purchasing software; and planning for innovative uses of technology in the school. The labs are heavily used by certain subject areas which results in other departments being able to schedule the lab only for occasional use (See Appendix C for a sample weekly schedule).

In this lab, 25 IBM computers and two printers are engaged every day using instructional software for the appropriate subject areas. Math teachers use remedial programs, fraction tutorials, pre-calculus, and trigonometry software to enhance their teaching. Computer science classes learn ADA programming. Classroom management software and desktop publishing software are the newest additions on the network and there are plans to train teachers in their use.

Other Areas. The journalism department has a temporary location this year while remodeling is taking place in their future lab area which will house a planned 25 to 30 Macintosh computers. Presently the school newspaper,

yearbook, and a county newsletter to parents is produced on four Macintosh computers and a laser printer, using word processing and desktop publishing programs. Many times the department is asked to produce brochures and programs for various functions or groups involved with the school. Advanced journalism students are involved in production of all the publications. Computer technology has been in use for about five years now and the journalism teacher would like to see a multimedia lab, television production, and integration of classes for the development and viewing of various in-house productions incorporated for future use. He can also see uses for having the new lab networked, a scanner, and an LCD pad for projections on a large screen in his teaching. The biggest stumbling block for these future goals is financial. Some plans may have to be deleted from the new lab because of lack of adequate funding.

Morgantown High School was selected as one of 28 schools in the United States to test the IBM Ultimedia products, *Columbus* and *Illuminated Books and Manuscripts*. Placed in a Social Studies classroom, the students use the station in groups, individually, or for whole-class viewing. Research on student-chosen or teacher-assigned topics is completed in a cross-curricular fashion; that is, the student can use the resources for assignments in any class. The Social Studies teacher has only recently become familiar with using technology in his classroom through attendance at a workshop and has become an advocate of its use. Future plans call for a large screen monitor to aid in entire-class viewing.

In addition to labs, teachers have access to Apple computers which are placed on carts and may be transported to individual classrooms. The Library has IBM computers and a TANDY machine with an encyclopedia installed for student use.

Summary of Results

Past Implementation. The most common, former uses of technology included posters, bulletin boards, filmstrips, and overhead transparencies with some lesser use of instructional television and computers. Since additional technology has become available in recent years, there has been an increase in the use of videotapes, stand-alone computers, teacher-station computers, and networked (lab) computers. CD-ROM technology and interactive videodiscs are also reported new uses of technology, albeit not to a great extent (see Figure 5).

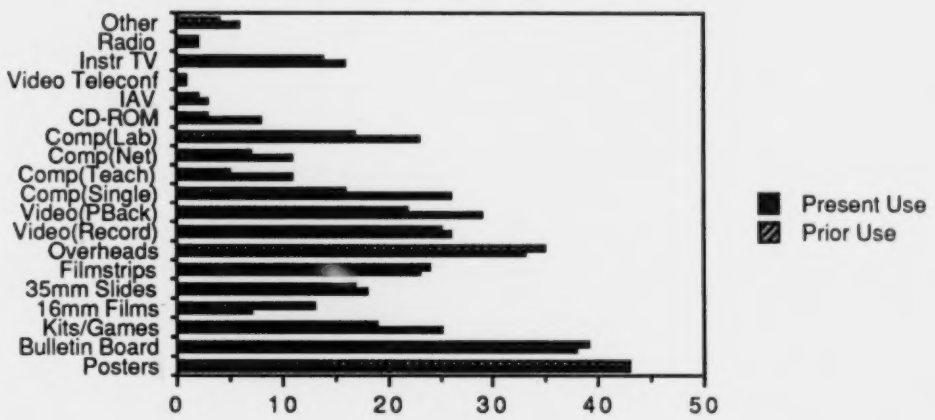

Figure 5

Present and Prior Technology Use - MHS

Present Implementation. Three computer labs form the basis for most computer activity at Morgantown High School including the: (1) Writing Lab, (2)

Business Lab, and (3) Math/Computer Science Lab. Due to the heavy use of these labs, there is not much available time for other subject areas to become greatly involved in technology use. Individual subject areas such as health and guidance are scheduled for use in the labs, but only on a limited basis. A core of teachers is learning to use ultimedia software and some are implementing it in their teaching. The journalism department creates a variety of publications which are all done on the computer. The Library has computers available for student use and transportable computers placed on carts can be used in classrooms.

Most teachers use technology in classroom instruction, but a strong second use is found in classroom management for record-keeping and a few are using it for professional development activities (see Figure 6). Survey results showed that in using technology for instructional use, it is being used mainly as a supplement to regular instruction, but many are using it as a primary and secondary method of teaching. One teacher reported the use of technology as a reward (see Figure 7). Drill and practice software is the leading type of software being used in the classroom, but tutorials have strong use, while games and programming languages also have places in the curricula (see Figure 8).

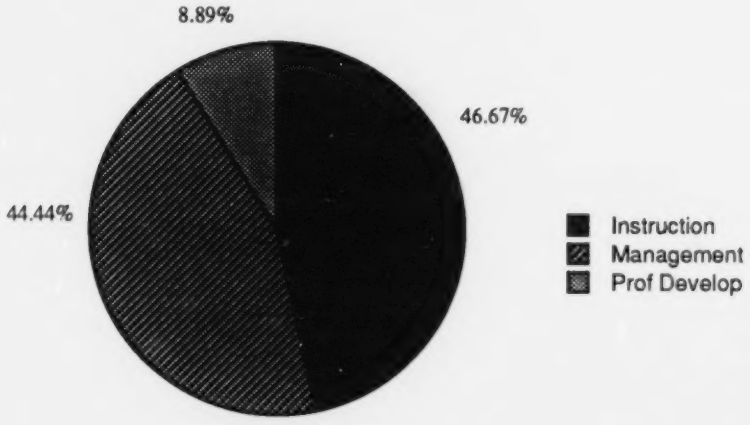

Figure 6
Overall Use of Technology

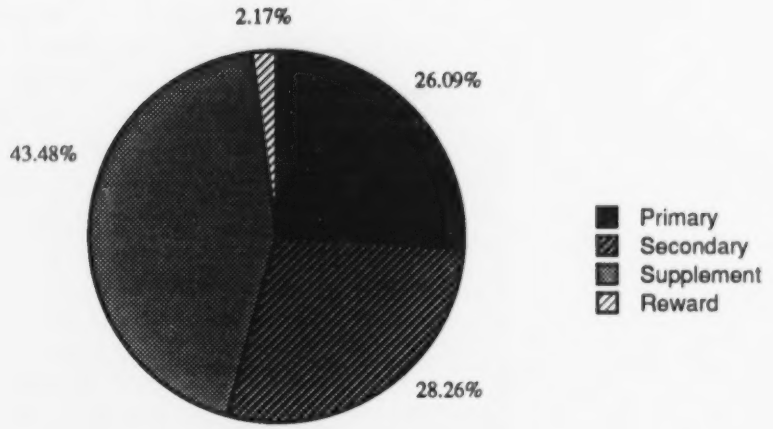

Figure 7
Instructional Use of Technology

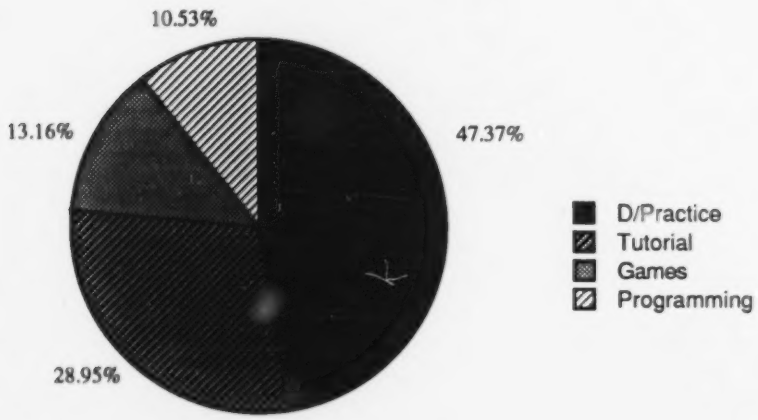

Figure 8
Type of Software Used

Future Implementation. The Technology Coordinator feels that the school is ready for computers to be placed in individual classrooms. Heavy use of the existing labs and disruption of the normal flow of classroom instruction through trips to the lab are problems that could be rectified by having technology available in the teacher's room. In response to an in-house survey of the faculty, a great majority were found to be in favor of expanding technology from the labs to their classrooms. Channel One television will soon be present in each room and teachers are looking forward to their future classroom which will contain one teacher and six student computer stations.

Recently, Morgantown High was awarded the status of a West Virginia School of Excellence. They have made inventive use of an older building in devising space for technology to be incorporated into the educational process. Many teachers and administrators are convinced of the worth of using a variety of tools to aid in the classroom and have implemented them in unique cross-curricular approaches.

Conclusions

In an almost unanimous voice, the teachers at East Dale Elementary and Morgantown High School agreed that technology is a necessary ingredient in restructuring schools. Many of them declared that, because of the abundance of technology in the "real world," the school should provide students with the knowledge of and the ability to handle what they will find in their everyday lives. On the other hand, with the same strength of voice, they stated that technology is only a tool in their arsenal and should be used as such in their teaching methodology.

Time for training and money for funding were problems raised by the faculty at both schools. The typical teacher's day is already full of demands, and finding the time to learn how to effectively use technology is a stumbling block for many of them. Often teachers use their own time to become acquainted with new tools. When the obstacle of training is overcome, the problem of financing modern technology is another issue to be addressed. A little use of technology seems to create the desire for more and improved technology. Money is a problem in all of society today, but especially in schools where tax dollars must be spent judiciously.

Both schools have managed to find ways to alleviate, to some extent, the problems of time and money in implementing technology in their schools. Aggressive and inventive applications for grant funding, along with County and State contributions, are common ways of purchasing equipment. Teachers have voluntarily given of their own time on occasion to learn new technology; while, in other instances, release time has been funded for training. Because of their strong feelings for the place of technology in education, faculty and administration have worked together to find solutions for these problems.

Restructuring efforts have created an atmosphere of cooperative and collaborative educational innovations. Cross-departmental pooling of resources, risk-taking, and new attitudes of ownership for the educational process have all contributed in allowing instructional activities to take new form and shape. Technology has played a vital part in many of these activities and in making both East Dale and Morgantown High worthy of being exemplars in educational circles.

The extremely cooperative faculties and administrators at both schools have afforded an enormous amount of information from this study. Future research implications include examining what ingredients are necessary for teachers to use technology in their classroom; advantages and disadvantages of technology in the classroom; if restructuring has caused an increase in the use of technology; and funding for technology.

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